



# DECHEMA

Gesellschaft für Chemische Technik  
und Biotechnologie e.V.



## PROGRAMME

16 – 20 September 2012  
Friedrichshafen, Lake Constance/Germany

# EURADH 2012

## 9<sup>th</sup> European Adhesion Conference

[www.euradh.org](http://www.euradh.org)



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IN COOPERATION WITH

**PROCESSNET**  
EINE INITIATIVE VON DECHEMA UND VDI-GVC



**sta**

**SFV**  
Société Française de Valeur

Societatea de Adhezie  
**Grupa Românească de Adhezie**



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## WELCOME ADDRESS

The **European Adhesion Conference – EURADH** – is a well-known biennial meeting for scientists and engineers from Europe and throughout the world who have an interest in adhesion with respect to science and all purposes of application.

EURADH 2012 will take place in Friedrichshafen at Lake Constance and is organised by a joint scientific committee representing DECHEMA (Germany), the Société Française du Vide (France), the Society of Adhesion and Adhesives (United Kingdom), and the Adhesion Society in Spain.

Being the 9th conference of this series, EURADH 2012 will address all questions concerning the community working in research, development and application of adhesion phenomena and technology.

The conference programme provides a mix through the various fundamental themes and application areas of adhesion, highlighting the most promising directions of research and applications, while allowing for in-depth discussions.

The scenic location guarantees an environment of relaxed and open exchange beyond the usual reserve. There will be plenty of time to foster contacts and numerous opportunities for networking with major players in the field.

We look forward to meeting you in the beautiful city of Friedrichshafen!

W. Possart  
Chairman

A. Hartwig  
Co-Chair

## COMMITTEES / PLENARY SPEAKERS

### SCIENTIFIC COMMITTEE

<b>J. Bishop</b>	Star Adhesion Limited, Cambridge Waterbeach/UK
<b>C. Creton</b>	ESPCI ParisTech/F
<b>G.W. Critchlow</b>	Loughborough University/UK
<b>A. Droste</b>	Dow Deutschland Anlagengesellschaft mbH, Schwalbach/D
<b>J. Finter</b>	Sika Technology AG, Zurich/CH
<b>M. Grunze</b>	University of Heidelberg/D
<b>A. Hartwig</b>	Fraunhofer IFAM, Bremen/D (conference co-chair)
<b>Y. Leterrier</b>	EPFL – Ecole Polytechnique Fédérale de Lausanne/CH
<b>J.M. Martín-Martínez</b>	University of Alicante/E
<b>F. Müller-Plathe</b>	TU Darmstadt/D
<b>L. Nick</b>	DECHEMA e.V., Frankfurt am Main/D
<b>W. Possart</b>	Saarland University, Saarbrücken/D (conference chair)
<b>G. Reiter</b>	University of Freiburg/D
<b>R. Schönfeld</b>	Henkel AG & Co. KGaA, Düsseldorf/D
<b>J.C. Suárez Bermejo</b>	Universidad Politécnica de Madrid/E
<b>D. Urban</b>	BASF SE, Ludwigshafen/D

### ORGANISING COMMITTEE

<b>A. Hartwig</b>	Fraunhofer IFAM, Bremen/D (conference co-chair)
<b>A. Köhl</b>	DECHEMA e.V., Frankfurt am Main/D
<b>L. Nick</b>	DECHEMA e.V., Frankfurt am Main/D
<b>W. Possart</b>	Saarland University, Saarbrücken/D (conference chair)

### PLENARY SPEAKERS

M.-G. Barthes-Labrousse, Université Paris-Sud, Orsay/F

**The role of chemical bonds in the formation of polymer/metal interphases: a critical assessment and future challenges**

M. Brede, Fraunhofer IFAM, Bremen/D

**Mechanical modelling of adhesively bonded joints**

M. Grunze, University of Heidelberg/D

**Settlement strategies of unicellular organisms**

J.G. Broughton, Oxford Brookes University/UK

**Structural bonding of timber**

# PROGRAMME AT A GLANCE

## Sunday, 16 September 2012

17:00 - 19:30 **Registration & Welcome Reception**

### Monday, 17 September 2012

09:30 - 09:45	<b>Opening Session</b>	
09:45 - 10:30	<b>PLENARY LECTURE</b> Barthes-Labrousse/F	
10:30 - 10:40	Break for Changing Lecture Hall	
	<b>Dynamic Adhesion I</b>	<b>Mechanics of Adhesive Joints I</b>
10:40 - 11:05	Chennevière/F	Krogh/D
11:05 - 11:30	Restagno/F	Diebels/D
11:30 - 12:00	Coffee Break	
	<b>Dynamic Adhesion II</b>	<b>Mechanics of Adhesive Joints II</b>
12:00 - 12:25	Kroner/D	Liebl/D
12:25 - 12:50	Heepe/D	Lion/D
12:50 - 13:15	Léger/F	Geiß/D
13:15 - 14:30	Lunch	
	<b>Fundamental Adhesion I</b>	<b>Ageing and Fatigue I</b>
14:30 - 14:55	Müller-Plathe/D	Goldschmidt/D
14:55 - 15:20	Hartwig/D	Gnoth/D
15:20 - 15:45	Nies/D	Arnaud/F
15:45 - 16:10	Fug/D	Ruoranen/FIN
16:10 - 18:00	<b>Coffee Break and Poster Discussion</b>	

### Tuesday, 18 September 2012

09:00 - 09:45	<b>PLENARY LECTURE</b> Brede/D	
09:45 - 09:55	Break for Changing Lecture Hall	
	<b>Surfaces for Adhesive Bonding I</b>	<b>Industrial Challenges I</b>
09:55 - 10:20	Friedrich/D	Finter/CH
10:20 - 10:45	Grundke/D	Schumacher/D
10:45 - 11:10	Tornow/D	Gössi/CH
11:10 - 11:40	Coffee Break	
	<b>Surfaces for Adhesive Bonding II</b>	<b>Ageing and Fatigue II</b>
11:40 - 12:05	Valantin/F	Adams/UK
12:05 - 12:30	Frenzel/D	Schleser/D
12:30 - 12:55	Schilinsky/D	Mizah/J
12:55 - 14:00	Lunch	
	<b>Chemistry and Nanotechnology I</b>	<b>Mechanics of Adhesive Joints III</b>
14:00 - 14:25	Lützen/D	Kinloch/UK
14:25 - 14:50	Kelch/CH	Bhuyan/F
14:50 - 15:15	Brethous/F	Jumel/F
15:15 - 15:45	Coffee Break	
	<b>Fundamental Adhesion II</b>	<b>Ageing and Fatigue III</b>
15:45 - 16:10	Nardin/F	Alia Garcia/E
16:10 - 16:35	Durinck/F	Aicher/D
16:35 - 18:00	<b>Poster Discussion</b>	

## PROGRAMME AT A GLANCE

### Wednesday, 19 September 2012

09:00 - 09:45	<b>PLENARY LECTURE</b> Grunze/D	
09:45 - 09:55	Break for Changing Lecture Hall	
	<b>Chemistry and Nanotechnology II</b>	<b>Mechanics of Adhesive Joints IV</b>
09:55 - 10:20	Kenig/IL	Cuminatto/F
10:20 - 10:45	Kishi/J	Sahoo/IND
10:45 - 11:10	Amkreutz/D	Teutenberg/D
11:10 - 11:40	Coffee Break	
	<b>Fundamental Adhesion III</b>	<b>Mechanics of Adhesive Joints V</b>
11:40 - 12:05	Balzer/D	Müller/L
12:05 - 12:30	Ozcan/D	Sawa/J
12:30 - 12:55	Takemura/J	Shanahan/F
12:55 - 14:00	Lunch	
from 14:00	<p><b>Time for Guided City Tour and / or Free Time at Your Disposal</b></p>	
18:30	<b>Conference Dinner: Cruise on Lake Constance</b>	

### Thursday, 20 September 2012

09:30 - 10:15	<b>PLENARY LECTURE</b> Broughton/UK	
10:15 - 10:25	Break for Changing Lecture Hall	
	<b>Ageing and Fatigue IV</b>	<b>Mechanics of Adhesive Joints VI</b>
10:25 - 10:50	Martín-Martínez/E	Schwarz/D
10:50 - 11:15	Bidaud/F	Rietz/D
11:15 - 11:45	Coffee Break	
	<b>Industrial Challenges II</b>	<b>Mechanics of Adhesive Joints VII</b>
11:45 - 12:10	Critchlow/UK	Miyagi/J
12:10 - 12:35	Wetzel/D	Créac'hcadec/F
12:35 - 13:00	Glaris/F	Hayashida/J
13:00 - 13:25	Bringmann/D	Sekiguchi/J
13:25 - 13:30	Break for Changing Lecture Hall	
13:30 - 14:00	<b>Poster Awards &amp; Closing Session</b>	
14:00	<b>End of the Conference</b>	

(Programme subject to change)

Monday, 17 September 2012

Ludwig-Dürr-Saal

9:30 **Opening Session***Chair: A. Hartwig, Fraunhofer IFAM, Bremen/D*

9:45

**PLENARY LECTURE****The role of chemical bonds in the formation of polymer/metal interphases: a critical assessment and future challenges**

M.-G. Barthes-Labrousse, Université Paris-Sud, Orsay/F

10:30 **Break for Changing Lecture Hall**

Alfred-Colsman-Saal

**Dynamic Adhesion I***Chair: P.L. Geiß, University of Kaiserslautern/D*

10:40

**Interdigitation dynamics of PS end-tethered polymer chains and slip at interfaces**

A. Chennevière, F. Restagno, University of Paris South, Orsay/F; F. Cousin, CEA, Saclay/F; E. Drockenmüller, University of Lyon, Villeurbanne/F; L. Léger, University of Paris South, Orsay/F

11:05

**Nanorheology of soft swollen polymer brushes**

E. Martinot, University of Paris South, Orsay/F; R. Villey, University of Lyon, Villeurbanne/F; F. Restagno, University of Paris South, Orsay/F; E. Charlaix, University of Lyon, Villeurbanne/F; L. Léger, University of Paris South, Orsay/F

11:30 **Coffee Break****Dynamic Adhesion II***Chair: M. Grunze, University of Heidelberg/D*

12:00

**Measuring adhesion on micropatterned surfaces: the role of alignment**

E. Kroner, E. Arzt, INM – Leibniz Institute for New Materials, Saarbrücken/D

12:25

**Adhesive contact at 180.000 fps: detachment behaviour of mushroom-shaped adhesive microstructure**

L. Heepe, A.E. Kovalev, S.N. Gorb, University of Kiel/D

12:50

**Elastic Cassie-Wenzel transition at textured soft elastomer interfaces: influence on adhesion and friction**

C. Poulard, E. Degrandi-Contraires, F. Restagno, L. Léger, University of Paris South, Orsay/F

13:15 **Lunch Break**



Monday, 17 September 2012

Alfred-Colsman-Saal

Fundamental Adhesion I	
	<i>Chair: M.-G. Barthes-Labrousse, Université Paris-Sud, Orsay/F</i>
14:30	<b>Polymer interphases studied at molecular resolution by multiscale simulation</b> F. Müller-Plathe, TU Darmstadt/D
14:55	<b>Molecular geometry in interphases</b> A. Hartwig, R. Meissner, Fraunhofer IFAM, Bremen/D; C. Merten, University of Alberta, Edmonton/CDN; P. Schiffels, P. Wand, I. Grunwald, Fraunhofer IFAM, Bremen/D
15:20	<b>Adhesion of isocyanates on native metal surfaces – Stability and the role of urea-like species</b> C. Nies, F. Fug, C. Otto, W. Possart, Saarland University, Saarbrücken/D
15:45	<b>In situ characterisation of chemical interactions between 4,4'-methylene diphenyl diisocyanate and native copper</b> F. Fug, C. Nies, W. Possart, Saarland University, Saarbrücken/D
16:10	<b>Coffee Break and Poster Discussion (till 18:00)</b>

## Monday, 17 September 2012

Ludwig-Dürr-Saal

9:30 **Opening Session***Chair: A. Hartwig, Fraunhofer IFAM, Bremen/D*

9:45

**PLENARY LECTURE****The role of chemical bonds in the formation of polymer/metal interphases: a critical assessment and future challenges**

M.-G. Barthes-Labrousse, Université Paris-Sud, Orsay/F

10:30 **Break for Changing Lecture Hall**

Ludwig-Dürr-Saal

**Mechanics of Adhesive Joints I***Chair: J. Finter, Sika Technology AG, Zurich/CH*

10:40

**The mechanical interphase in adhesive joints – viscoelastic properties**

L. Krogh, L. Depollier, E. Bosset, W. Possart, Saarland University, Saarbrücken/D

11:05

**Effective thermomechanical properties of adhesive bonds: a modelling approach**

S. Diebels, Saarland University, Saarbrücken/D; M. Johlitz, Bundeswehr University, Munich/D; W. Possart, Saarland University, Saarbrücken/D

11:30

**Coffee Break****Mechanics of Adhesive Joints II***Chair: R.D. Adams, University of Oxford/UK*

12:00

**Chemo-thermomechanical combination of viscoelastic and viscoplastic material models for the simulation of curing adhesives**

C. Liebl, M. Johlitz, A. Lion, Bundeswehr University, Munich/D

12:25

**Modelling and simulation of the temperature-dependent behaviour of supported polymer films**

A. Lion, M. Johlitz, Bundeswehr University, Munich/D

12:50

**Experimental investigation of the volume dilation of adhesives in the diffusion-controlled curing regime**

M. Schumann, P.L. Geiß, University of Kaiserslautern/D

13:15

**Lunch Break**

Monday, 17 September 2012

Ludwig-Dürr-Saal

Ageing and Fatigue I	
	<i>Chair: A. Droste, DOW Deutschland Anlagengesellschaft mbH, Schwalbach/D</i>
14:30	<b>Modelling inhomogeneous material properties in ageing bonds</b> S. Diebels, F. Goldschmidt, Saarland University, Saarbrücken/D
14:55	<b>Combined electrochemical and in-situ FTIR spectroscopic studies of de-adhesion processes of polymer films on oxide covered metals</b> C. Gnoth, K. Pohl, G. Grundmeier, University of Paderborn/D
15:20	<b>Analysis of moisture effect on the mechanical behaviour of an adhesively bonded joint under multi-axial loads</b> N. Arnaud, J.Y. Cognard, R. Créac'hcadec, ENSTA Bretagne, Brest/F; P. Davies, IFREMER, Plouzané/F
15:45	<b>The influence of surface pretreatments on the strength of epoxy-based adhesive aluminium joints under combined static loading and environmental ageing conditions</b> J. Ruoranan, T. Tiainen, TU Tampere/FIN
16:10	<b>Coffee Break and Poster Discussion (till 18:00)</b>

Tuesday, 18 September 2012

*Ludwig-Dürr-Saal**Chair: A. Lion, Bundeswehr University, Munich/D*

9:00 **PLENARY LECTURE**  
**Mechanical modelling of adhesively bonded joints**  
 M. Brede, Fraunhofer IFAM, Bremen/D

9:45 **Break for Changing Lecture Hall**

*Alfred-Colsman-Saal*

### Surfaces for Adhesive Bonding I

*Chair: G.W. Critchlow, Loughborough University/UK*

9:55 **Covalent bonding of Al-PP by spacers at the interface**  
 J. Friedrich, R. Mix, H. Yin, BAM - Federal Institute for Materials Research and Testing, Berlin/D

10:20 **Modifying polymer surfaces to control adhesion in the fabrication of integrated circuits**  
 K. Grundke, A. Förster, C. Bellmann, A. Drechsler, V. Albrecht, M. Nitschke, F. Simon, S. Zschoche, S. Michel, B. Voit, M. Stamm, Leibniz Institute of Polymer Research Dresden/D; J. Roth, University of Applied Sciences Zittau/Görlitz/D

10:45 **The use of optical emission spectroscopy for quality assurance in adhesive bonding technology**  
 H. Hildebrandt, S. Stepanov, C. Tornow, S. Markus, J. Ihde, S. Dieckhoff, Fraunhofer IFAM, Bremen/D

11:10 **Coffee Break**

### Surfaces for Adhesive Bonding II

*Chair: H. Kanazawa, Fukushima University/J*

11:40 **Study of the RFL/rubber interface in a cord-rubber composite**  
 C. Valantin, M.P. Deffarges, F. Lacroix, François Rabelais University, Joué-lès-Tours/F; J. Morcel, Hutchinson, Joué-lès-Tours/F; N. Aït Hocine, François Rabelais University, Joué-lès-Tours/F

12:05 **Adhesion promotion by polyelectrolyte coatings at laser structured aluminium surfaces**  
 R. Frenzel, Leibniz Institute of Polymer Research Dresden/D; I. Jansen, Fraunhofer IWS, Dresden/D; T. Schiefer, TU Dresden/D; F. Simon, Leibniz Institute of Polymer Research Dresden/D

12:30 **Surface activation of polymers by incoherent VUV radiation**  
 L. Schilinsky, C. Dölle, R. Wilken, Fraunhofer IFAM, Bremen/D

12:55 **Lunch Break**

Tuesday, 18 September 2012

Alfred-Colsman-Saal

**Chemistry and Nanotechnology I***Chair: J.M. Martín-Martínez, University of Alicante/E*

- 14:00 **Influence of molecular order on the mechanical properties of epoxy resins**  
H. Lützen, A. Hartwig, Fraunhofer IFAM, Bremen/D
- 14:25 **Biobased and biodegradable polyurethane adhesives**  
S. Kelch, Sika Technology AG, Zurich/CH
- 14:50 **Models of assemblages by collage of hybrid structures**  
R. Brethous, V. Nassiet, J-A. Petit, B. Hassoune-Rhabbour, National Engineering School of Tarbes/F

15:15 **Coffee Break****Fundamental Adhesion II***Chair: J. Bishopp, Star Adhesion Limited, Cambridge/UK*

- 15:45 **Interfacial covalent bonds and adhesion of elastomers**  
M. Palmieri, A. Airoudj, V. Roucoules, M.-F. Vallat, M. Nardin, University of Haute-Alsace, Mulhouse/F
- 16:10 **Understanding the buckling phenomenon of thin films**  
C. Coupeau, J. Colin, J. Durinck, A. Ruffini, A. Cimetière, J. Grilhé, University of Poitiers, Futuroscope/F
- 16:35 **Poster Discussion (till 18:00)**

Tuesday, 18 September 2012

Ludwig-Dürr-Saal

*Chair: A. Lion, Bundeswehr University, Munich/D*

9:00 **PLENARY LECTURE**  
**Mechanical modelling of adhesively bonded joints**  
 M. Brede, Fraunhofer IFAM, Bremen/D

9:45 **Break for Changing Lecture Hall**

Ludwig-Dürr-Saal

### Industrial Challenges I

*Chair: G. Grundmeier, University of Paderborn/D*

9:55 **Shape memory adhesives – fundamental challenges**  
 M. Gössi, J. Finter, R. Xu-Rabl, Sika Technology AG, Zurich/CH

10:20 **New water-borne adhesives for flexible food packaging**  
 K. Schumacher, BASF SE, Ludwigshafen/D

10:45 **Foaming thermoplastic sealants – fundamental challenge**  
 M. Gössi, J. Finter, Sika Technology AG, Zurich/CH

11:10 **Coffee Break**

### Ageing and Fatigue II

*Chair: J.G. Broughton, Oxford Brookes University/UK*

11:40 **Adhesives and joints under the combined attack of moisture and stress**  
 R.D. Adams, University of Oxford/UK; T.J. Brearley, L. Liu, University of Bristol/UK

12:05 **Ageing resistance evaluation of thermally joined metal/plastic joints**  
 U. Reisgen, M. Schleser, S. Scheik, RWTH Aachen University/D

12:30 **Strength prediction of adhesively bonded joint by discolorations of adhesive and stress analysis approach**  
 B. Mizah, A. Tanaka, N. Yamamoto, Takushoku University, Tokyo/J; S. Yoshida, Tokyo University of Agriculture and Technology/J; C. Sato, Tokyo Institute of Technology, Yokohama/J

12:55 **Lunch Break**

**Tuesday, 18 September 2012**

*Ludwig-Dürr-Saal*

**Mechanics of Adhesive Joints III**

*Chair: M. Brede, Fraunhofer IFAM, Bremen/D*

- 14:00 **Using the peel test to measure the adhesive fracture energy, G**  
A.J. Kinloch, H. Koay, S.H. Lee, L. Ng, Imperial College London/UK
- 14:25 **Crack propagation at the interface between a poly n-butyl acrylate model PSA and model substrates**  
S. Bhuyan, F. Tanguy, D. Martina, C. Creton, A. Lindner, M. Ciccotti, ESPCI Paris Tech/F
- 14:50 **Backface strain monitoring of DCB and ENF tests**  
N. Ben Salem, J. Jumel, M.E.R. Shanahan, M.K. Budzik, University of Bordeaux, Talence/F; F. Lavelle, CNES, Evry/F
- 15:15 **Coffee Break**

**Ageing and Fatigue III**

*Chair: L.F.M. da Silva, University of Porto/P*

- 15:45 **Long term ageing of adhesives for hybrid materials in seawater**  
J.C. Suarez, C. Alia, Polytechnic University of Madrid/E; M.V. Biezma, Polytechnic University of Cantabria, Santander/E; P. Pinilla, J.M. Arenas, Polytechnic University of Madrid/E
- 16:10 **Ageing and duration of load effect in glued structural timber joints**  
S. Aicher, C. Rothkopf, G. Stapf, J. Hezel, University of Stuttgart/D
- 16:35 **Poster Discussion (till 18:00)**

**Wednesday, 19 September 2012**

*Ludwig-Dürr-Saal*

*Chair: W. Possart, Saarland University, Saarbrücken/D*

9:00 **PLENARY LECTURE**  
**Settlement strategies of unicellular organisms**  
 M. Grunze, A. Rosenhahn, University of Heidelberg/D

9:45 **Break for Changing Lecture Hall**

*Alfred-Colsman-Saal*

### Chemistry and Nanotechnology II

*Chair: J.C. Suárez, Polytechnic University of Madrid/E*

9:55 **Nano enhanced nodule morphology and properties of epoxy adhesives**  
 H. Dodiuk, S. Kenig, M. Shnieder, Shenkar College of Engineering & Design, Ramat Gan/IL; R. Tenne, Weizmann Institute of Science, Rehovot/IL

10:20 **Electric conductive epoxy / silver filler adhesives with self-assembly micro-phase structures**  
 H. Kishi, S. Tanaka, Y. Nakashima, University of Hyogo/J

10:45 **Improving the barrier properties of UV-curing epoxy adhesives using silsesquioxanes**  
 M. Amkreutz, J. Kolbe, Fraunhofer IFAM, Bremen/D

11:10 **Coffee Break**

### Fundamental Adhesion III

*Chair: M. Nardin, University of Haute-Alsace, Mulhouse/F*

11:40 **AFM based investigations on the dynamics and self-healing of adhesives**  
 B. Balzer, S. Krysiak, T. Hugel, TU München/D

12:05 **Chemical force microscopy studies of the interaction between ZnO surfaces and organic acid groups**  
 O. Ozcan, B. Ozkaya, K. Pohl, G. Grundmeier, University of Paderborn/D

12:30 **In-situ analysis of bond line of water based polymer-isocyanate adhesives for wood using near infrared spectroscopy**  
 Y. Omura, N. Hori, T. Iwata, A. Takemura, University of Tokyo/J

12:55 **Lunch Break**

14:00 **Time for Guided City Tour**

18:30 **CONFERENCE DINNER**



## Wednesday, 19 September 2012

Ludwig-Dürr-Saal

*Chair: W. Possart, Saarland University, Saarbrücken/D*

9:00 **PLENARY LECTURE**  
**Settlement strategies of unicellular organisms**  
M. Grunze, A. Rosenhahn, University of Heidelberg/D

9:45 **Break for Changing Lecture Hall**

Ludwig-Dürr-Saal

**Mechanics of Adhesive Joints IV***Chair: T. Sawa, Hiroshima University/J*

9:55 **Measuring and modelling patterned BCB/Si interface adhesion**  
C. Cuminatto, G. Parry, M. Braccini, University of Grenoble, St Martin d'Hères/F

10:20 **Failure criteria to predict the strength of adhesively bonded lap joints**  
P.K. Sahoo, K. Santhosh, V.R. Ranganath, CSIR-National Aerospace Laboratories, Bangalore/IND; B. Dattaguru, International Institute for Aerospace Engineering and Management, Bangalore/IND

10:45 **Analytical prediction of influences of production tolerances on adhesive bonded joints under cyclic loads**  
G. Meschut, O. Hahn, D. Teutenberg, University of Paderborn/D

11:10 **Coffee Break**

**Mechanics of Adhesive Joints V***Chair: S. Kenig, Shenkar College of Engineering & Design, Ramat Gan/IL*

11:40 **Temperature modulated optical refractometry or how to measure the coefficient of thermal expansion across a liquid-solid transition?**  
U. Müller, M. Philipp, R. Sanctuary, J.-K. Krüger, University of Luxemburg/L

12:05 **Stress analysis and strength evaluation of scarf adhesive joints subjected to impact tensile loadings**  
H. Nakano, Y. Sekiguchi, T. Sawa, Hiroshima University/J

12:30 **Adhesion perturbation due to surface heterogeneity**  
M. Shanahan, M. Budzik, J. Jumel, University of Bordeaux, Talence/F

12:55 **Lunch Break**

14:00 **Time for Guided City Tour**

18:30 **CONFERENCE DINNER**

Thursday, 20 September 2012

Ludwig-Dürr-Saal

Chair: A. Takemura, University of Tokyo/J

9:30 **PLENARY LECTURE**  
**Structural bonding of timber**  
 J.G. Broughton, Oxford Brookes University/UK

10:15 Break for Changing Lecture Hall

Alfred-Colsman-Saal

### Ageing and Fatigue IV

Chair: M. Shanahan, University of Bordeaux, Talence/F

10:25 **Degradation studies of rosin containing thermoplastic polyurethane sealants**  
 M.P. Carbonell-Blasco, University of Alicante/E; I. Antoniac, Polytechnic University of Bucharest/RO; J.M. Martín-Martínez, University of Alicante/E

10:50 **Analysis of the cyclic behaviour of an adhesive in an assembly under tensile-shear loading**  
 P. Bidaud, R. Créac'hcadec, D. Thévenet, J.Y. Cognard, ENSTA Bretagne, Brest/F

11:15 Coffee Break

### Industrial Challenges II

Chair: J. Friedrich, BAM - Federal Institute for Materials Research and Testing, Berlin/D

11:45 **A review of state-of-the-art processes for bonding aluminium alloys**  
 G.W. Critchlow, K.A. Yendall, Loughborough University/UK; T. Cartwright, AWE Aldermaston, Reading/UK; I.A. Ashcroft, Loughborough University/UK

12:10 **Ultrasonic / megasonic assisted primer application for structural adhesive bonding**  
 M. Wetzel, J. Holtmannspötter, J. von Czarnecki, Bundeswehr Research Institute for Materials, Fuels and Lubricants, Erding/D; H.-J. Gudladt, Bundeswehr University, Munich/D

12:35 **Fluorine surface enrichment of epoxy resins: a way for easier composite materials demoulding?**  
 P. Glaris, University of Maine, Le Mans/F; M. Dorget, CTTM, Le Mans/F; J.F. Coulon, ECAM Rennes – Louis de Broglie/F; F. Poncin-Epaillard, University of Maine, Le Mans/F

13:00 **APP-CVD as pre-treatment for structural bonding in aircraft industry – a potential alternative to anodising or silane treatments?**  
 P. Bringmann, Airbus, Hamburg/D; M. Kolb, D. Raps, EADS Innovation Works, Ottobrunn/D; I. Jansen, Fraunhofer IWS, Dresden/E

13:25 Break for Changing Lecture Hall

Ludwig-Dürr-Saal

13:30 **Poster Awards and Closing Session**

14:00 End of the Conference

## Thursday, 20 September 2012

Ludwig-Dürr-Saal

Chair: A. Takemura, University of Tokyo/J

9:30 **PLENARY LECTURE**  
**Structural bonding of timber**  
 J.G. Broughton, Oxford Brookes University/UK

10:15 Break for Changing Lecture Hall

Ludwig-Dürr-Saal

## Mechanics of Adhesive Joints VI

Chair: H. Kishi, University of Hyogo/J

10:25 **In-Situ deformation measurement of laminated wood by using electrical modified adhesives**  
 U. Schwarz, C. Winkler, University of Applied Sciences Eberswalde/D

10:50 **Determination of adhesive strength by means of the centrifuge test**  
 U. Rietz, D. Lerche, LUM GmbH, Berlin/D; S. Hielscher, U. Beck, BAM – Federal Institute for Materials Research and Testing, Berlin/D

11:15 Coffee Break

## Mechanics of Adhesive Joints VII

Chair: A.J. Kinloch, Imperial College London/UK

11:45 **Comparison of static and dynamic shear properties in micro shear test for pressure sensitive adhesive**  
 Z. Miyagi, Meiji University, Kawasaki/J

12:10 **Experimental analysis of the mechanical behaviour of a flexible adhesive under tensile/compression-shear loads**  
 R. Créac'hcadec, G. Jamin, J.Y. Cognard, ENSTA Bretagne, Brest/F; P. Jousset, Sika Technology AG, Zurich/CH

12:35 **Characterisation of mixed mode fracture toughness of joints bonded with pressure sensitive adhesives**  
 S. Hayashida, C. Sato, Tokyo Institute of Technology, Yokohama/J

13:00 **Effect of elastic modulus on adhesion contact between an elastic body and a rigid body with surface roughness and a defect**  
 Y. Sekiguchi, P. Hemthavy, S. Saito, K. Takahashi, Tokyo Institute of Technology/J

13:25 Break for Changing Lecture Hall

Ludwig-Dürr-Saal

13:30 **Poster Awards and Closing Session**

14:00 End of the Conference

## POSTER PROGRAMME

### POSTER AWARD INFORMATION

On all EURADH conferences, the poster presentation of latest results was and is a most important facet of the scientific programme. Thanks to the generous sponsorship by JOWAT AG Detmold (Germany), this role will be emphasised in Friedrichshafen by the Best Poster Award which will be awarded by an international jury.

- 
- P 01 **D<sub>2</sub>O as a tracer for absorption and reactions of water during the hydrothermal ageing of epoxy-dicyandiamide adhesives**  
J.C. Gaukler, T. Knecht, G. Meistemann, D. Schäfer, W. Possart, Saarland University, Saarbrücken/D
- 
- P 02 **How does an accelerator influence the molecular dynamics of an epoxy-dicyandiamide adhesive?**  
J.C. Gaukler, O. Devriendt, L. Krogh, W. Possart, Saarland University, Saarbrücken/D
- 
- P 03 **Mechanical analysis of structural adhesive for marine joints**  
M. Marini, P. Molendi, F. Di Silvestri, E. Rivalta, C. Bonacini, I.C.R. Sprint S.P.A., Reggio Emilia/I
- 
- P 04 **Surface treatment of vulcanised natural rubber containing noticeable amount of antiozonant paraffin wax moieties**  
A.J. Yañez-Pacios, J.A. Jofre-Reche, J.M. Martín-Martínez, University of Alicante/E
- 
- P 05 **Different dispersion procedures of nanofillers in thermoplastic polyurethane nanocomposites**  
J. Donate-Robles, University of Alicante/E; S. Livi, J. Duchet-Rumeau, J.F. Gerárd, INSA-Lyon, Villeurbanne/F; J.M. Martín-Martínez, University of Alicante/E
- 
- P 06 ***In situ* characterisation of chemical interactions between 4,4'-methylene diphenyl diisocyanate and native metal surfaces**  
F. Fug, C. Nies, W. Possart, Saarland University, Saarbrücken/D
- 
- P 07 **Adsorption and adhesion of methylene diphenyl diisocyanate (MDI) isomers on aluminium**  
C. Nies, F. Fug, C. Otto, J. Summa, W. Possart, Saarland University, Saarbrücken/D
- 
- P 08 ***cancelled***
- 
- P 09 **Toughening of polybenzoxazine by in situ polymerisation method**  
K. Hirao, T. Oyama, A. Takahashi, Yokohama National University/J
- 
- P 10 **Application to epoxy resins of steam explosion lignin derived from softwood**  
Y. Kawano, T. Oyama, A. Takahashi, Yokohama National University/J

- P 11 **Synthesis and thermal properties of new polymer alloys, epoxy resin cured with reactive super engineering plastic**  
Y. Horiuchi, T. Oyama, A. Takahashi, Yokohama National University/J
- 
- P 12 **Optimisation of adhesive bonding repair processes for carbon fibre reinforced plastics (CFRP) of military aircraft structures**  
J. Holtmannspötter, Bundeswehr Research Institute for Materials, Fuels and Lubricants, Erding/D; F.K. Feucht, Waffensystemkommando der Luftwaffe, Cologne/D; M. Wetzel, J. von Czarnecki, Bundeswehr Research Institute for Materials, Fuels and Lubricants, Erding/D
- 
- P 13 **Morphology of polyurethanes**  
H. Lützen, Fraunhofer IFAM, Bremen/D; B.K. Kim, Pusan National University/ROK; A. Hartwig, Fraunhofer IFAM, Bremen/D
- 
- P 14 **Numerical study of deformation behaviour of high performance adhesive tapes influenced by foil backing**  
R. Raghunath, D. Juhre, Deutsches Institut für Kautschuktechnologie e.V., Hannover/D
- 
- P 15 **DCB specimens of adhesive joints loaded in pure moments**  
J.C. Suarez, G. Ekwa, P. Pinilla, M.A. Herreros, Polytechnic University of Madrid/E
- 
- P 16 **Direct synthesis of new silane-modified polymers by DMC-alkoxylation**  
A. Lewin, M. Roessing, S. Giessler-Blank, Evonik Industries AG, Essen/D
- 
- P 17 **Cohesive and adhesive test for micro and nanoparticle-based coatings using sonication**  
L. Vonna, W. Heni, University of Haute-Alsace, Mulhouse/F; H. Haidara, Institut de Science des Matériaux de Mulhouse/F
- 
- P 18 **Heat transfer and fouling setup to test coatings under sub- and boiling conditions**  
M. Schmitt, F. Heib, Saarland University, Saarbrücken/D
- 
- P 19 **Improvement in adhesive and coating properties of polyolefins, silicone resin and other stable polymeric materials**  
H. Kanazawa, A. Inada, Fukushima University/J
- 
- P 20 **Adhesive high speed controlled strain rate tests**  
F. Altenwegner, K.F. Reiling, University of Applied Sciences Landshut/D
- 
- P 21 **Flying through the air: riveted zeppelins and bonded wooden aircraft**  
K.F. Reiling, F. Altenwegner, University of Applied Sciences Landshut/D
- 
- P 22 **Ageing of polyurethane – mild steel adhesive joints: mechanical and chemical effects**  
J. Huacuja-Sanchez, P. Engel, D. Schäfer, W. Possart, Saarland University, Saarbrücken/D
- 
- P 23 **Determination of viscoelastic properties in adhesive joints**  
L. Krogh, L. Depollier, W. Possart, Saarland University, Saarbrücken/D

## POSTER PROGRAMME

- P 24 **Viscoelastic properties of adhesive joints: the influence of the metal substrate**  
L. Krogh, L. Depollier, E. Bosset, W. Possart, Saarland University, Saarbrücken/D
- 
- P 25 **Delamination of thick-adherend steel/CFRP laminate connections**  
N. Yahya, S. Hashim, University of Glasgow/UK
- 
- P 26 **UV-curable epoxy primer for adhesion in steel reinforced polymer composites**  
B. Golaz, V. Michaud, Federal Polytechnic School of Lausanne/CH
- 
- P 27 **High strain rate behavior of bonded constructs**  
A. Mitchell, G. Critchlow, Loughborough University/UK; S. Shaw, DSTL, Salisbury/UK;  
M. Aufray, University of Toulouse/F
- 
- P 28 **Obtaining a model of viscoelastic behavior of mixed adhesive joints and its simulation with Bond Graph's technique**  
R. Ocaña, J.M. Arenas, C. Alía, J.J. Narbón, Polytechnic University of Madrid/E
- 
- P 29 **AFM based detection of single polymer adhesion and friction on solid-liquid interfaces and thin film interphases**  
B.N. Balzer, T. Hugel, TU München/D
- 
- P 30 **LUMiFrac – the new centrifuge-based desktop adhesion analyser: a new approach for testing adhesive and tensile strength**  
U. Rietz, D. Lerche, LUM GmbH, Berlin/D; S. Hielscher, U. Beck, BAM – Federal Institute for Materials Research and Testing, Berlin/D
- 
- P 31 **Fatigue behaviour of adhesive bonded structures**  
S. Frömmel, H.-J. Gudladt, Bundeswehr University, Munich/D
- 
- P 32 **New variants for the copolymerisation of propylene oxide and carbon dioxide**  
E. Paetzold, R. Bratsch, Leibniz Institute for Catalysis, Rostock/D; U. Kragl, University of Rostock/D; J. Klein, J.-E. Damke, Henkel AG & Co. KGaA, Düsseldorf/D
- 
- P 33 **Adhesion measurements of metal films on plasma-functionalised polymer foils and specially designed interfaces for optimum coupling**  
R. Mix, S. Hielscher, J.F. Friedrich, U. Beck, BAM – Federal Institute for Materials Research and Testing, Berlin/D
- 
- P 34 **Atmospheric pressure plasma devices and processings for a wide range of 3D products**  
J. Dutroncy, E. Jouvet, T. Sindzingre, AcXys Technologies, St.-Martin-le-Vinoux/F
- 
- P 35 **High temperature bonding and post cure behavior of epoxy adhesives**  
H.Y. Kim, S.J. Lee, J.H. Bang, M.S. Kim, J.K. Kim, Korea Institute of Industrial Technology, Incheon/ROK

- P 36 **Effects of additives on the rheological behavior of epoxy adhesives**  
S.J. Lee, H.Y. Kim, M.S. Kim, J.H. Kim, J.K. Kim, Korea Institute of Industrial Technology, Incheon/ROK
- 
- P 37 **Weldbonding of high strength steels in automotive body-in-white applications**  
G. Weber, BAM – Federal Institute for Materials Research and Testing, Berlin/D; H. Thommes, University of Paderborn/D; T. Bschorr, German Welding Institute SLV Munich/D; O. Hahn, University of Paderborn/D; H. Cramer, German Welding Institute SLV Munich/D; M. Rethmeier, BAM – Federal Institute for Materials Research and Testing, Berlin/D
- 
- P 38 **Identification of a cohesive zone model for debonding of adhesive joints**  
M. Alfano, G. Lubineau, King Abdullah University of Science and Technology, Thuwal/SAR
- 
- P 39 **Potentiometric investigation of electrochemical reactions in adhesively bonded joints between different metals**  
P. L. Geiß, University of Kaiserslautern/D
- 
- P 40 **The effect of material properties on the strength of adhesively bonded thermoplastic composites**  
J.-S. Pap, TU Dresden/D; I. Jansen, Fraunhofer IWS, Dresden/D
- 
- P 41 **Laser structuring of aluminium surfaces and subsequent organophilic coating for structural bonding**  
T. Schiefer, TU Dresden/D; I. Jansen, Fraunhofer IWS, Dresden/D; R. Frenzel, F. Simon, Leibniz Institute of Polymer Research Dresden/D
- 
- P 42 **Multifunctional adhesives by integration of carbon nanotubes**  
F. Wehnert, TU Dresden/D; I. Jansen, Fraunhofer IWS, Dresden/D; J. Heinrich, TU Dresden/D
- 
- P 43 **How to measure curing behavior of smart adhesives?**  
S. Harling, S. Schaible, O. Meincke, Zurich University of Applied Science, Winterthur/CH
- 
- P 44 **How to make a cylinder roll uphill**  
S. Mondal, A. Ghatak, Indian Institute of Technology Kanpur, UP/IND
- 
- P 45 **Nanostructured epoxy resin with improved hydrothermal ageing resistance**  
F. Piasecki, CEA/DAM Le Ripault, Monts/F; E. Papon, University of Bordeaux, Pessac/F; J.-F. Salas, CEA/DAM Le Ripault, Monts/F; E. Ibarboure, University of Bordeaux, Pessac/F
- 
- P 46 **changed to oral presentation**  
Thursday, 20 Sept, 10.50 Alfred-Colsman-Saal
- 
- P 47 **Material platform for dielectric elastomer actuators**  
T. Köckritz, TU Dresden/D; I. Jansen, Fraunhofer IWS, Dresden/D; R. Luther, A. Richter, TU Dresden/D

- P 48 **The fabrication of dual curable pressure-sensitive adhesives for temporary bonding-debonding**  
S.-W. Lee, J.-W. Park, C.-H. Park, H.-J. Kim, Seoul National University/ROK; J.-Y. Song, J.-H. Lee, Korea Institute of Machinery & Materials, Daejeon/ROK; E.-A. Kim, Ulsan Fine Chemical Industry Center, Ulsan/ROK
- 
- P 49 **Preparation and characterization of adhesive for through silicone via- multi chip packaging with temporary bonding-debonding adhesive**  
C.-H. Park, J.-W. Park, S.-W. Lee, D.-H. Lim, H.-J. Kim, Seoul National University, Seoul/ROK; J.-Y. Song, J.-H. Lee, Korea Institute of Machinery & Materials, Daejeon/ROK
- 
- P 50 **UV- and IR-laser pre-treatment of CFRP for adhesive bonding**  
F. Fischer, S. Kreling, K. Dilger, TU Braunschweig/D
- 
- P 51 **Viscoelasticity effects in adhesive joints**  
M. Budzik, J. Jumel, M. Shanahan, University of Bordeaux, Talence/F
- 
- P 52 **Instrumented fracture mechanics tests**  
J. Jumel, M. Shanahan, M. Budzik, University of Bordeaux, Talence/F
- 
- P 53 **Study on curing mechanism and kinetics of diallyl-bearing epoxy resin using sulfur as curing agent**  
G. Zhang, J. Cheng, L. Shi, X. Lin, J. Zhang, Beijing University of Chemical Technology, Changzhou/PRC
- 
- P 54 **Combined in-situ QCM and FTIR studies of the influence of UV irradiation and relative humidity on TiO<sub>2</sub> particle ensembles**  
B. Torun, C. Kunze, G. Grundmeier, University of Paderborn/D
- 
- P 55 **Validation approach for adhesive joints in the vehicle industry**  
D. Pletinckx, P. Franssen, P. Campestrini, Flanders' DRIVE, Lommel/B
- 
- P 56 **Stress analysis and strength evaluation of scarf adhesive joints subjected to static bending moments**  
H. Nakano, Y. Sekiguchi, T. Sawa, Hiroshima University/J
- 
- P 57 **Stress analysis and strength evaluation of scarf adhesive joints subjected to static tensile loadings**  
H. Nakano, Y. Sekiguchi, T. Sawa, Hiroshima University/J
- 
- P 58 **Complex flow and dynamic behaviors of an epoxy precursor**  
M. Thomassey, J. Baller, J.K. Krüger, R. Sanctuary, University of Luxemburg/L
- 
- P 59 **Optimised bonding effects on surfaces as a result of plasma pre-treatment**  
C.N. Dietel, Diener electronic GmbH + Co. KG, Ebhausen/D



## POSTER PROGRAMME

- P 60 **Influence of the mechanical behaviour of different adhesives on an interference-fit/adhesively bonded cylindrical joint**  
G. Gallio, M. Lombardi, P. Fino, L. Montanaro, Politecnico di Torino/I; D. Rovarino, MW Italia S.p.A, Rivoli/I
- 
- P 61 **Intelligent materials with adaptive adhesion properties from biocompatible comb-like polymer brushes**  
E. Svetushkina, Leibniz Institute of Polymer Research Dresden/D; D. Martina, C. Creton, ESPCI Paris Tech/F; A. Synytska, Leibniz Institute of Polymer Research Dresden/D
- 
- P 62 **Surface modification of a photo definable epoxy resin with polyamines and polydopamine to improve adhesion with electroless deposited copper**  
D. Schaubroeck, J. De Baets, P. Dubruel, Ghent University, Zwijnaarde/B; L. Van Vaeck, University of Antwerp, Wilrijk,/B; A. Van Calster, Ghent University, Zwijnaarde/B
- 
- P 63 **TGA-FTIR-MS Studies on pMDI with enhanced fire retardant properties**  
A. Daniliuc, B. Deppe, D. Kruse, R. Marutzky, Fraunhofer Institute for Wood Research WKI, Braunschweig/D

(programme subject to change)

## SOCIAL PROGRAMME

**Sunday, 16<sup>th</sup> September 2012**

**17:00 – 19:30**

### Welcome Reception

The conference will start with a welcome reception for all participants on Sunday, 16<sup>th</sup> September 2012 in the Graf-Zeppelin-Haus in Friedrichshafen. Drinks and snacks will be served by invitation of the organisers. Please register online (free of charge).



© Graf-Zeppelin-Haus

**Monday, 17<sup>th</sup> September 2012**

**16:10 – 18:00**

**Tuesday, 18<sup>th</sup> September 2012**

**16:35 – 18:00**

### Poster Discussion

Visit the posters and talk to the exhibitors and to your colleagues. The poster discussion will take place in the foyer of the lecture halls among the poster walls and exhibition stands allowing active discussion.

**Wednesday, 19<sup>th</sup> September 2012**

**14:00 – approx. 15:30**

### Guided City Tour

Meeting point:

main entrance of the Graf-Zeppelin-Haus

This English guided tour includes a 90 to 105 minutes walk through the city and a visit of the twintowered Schlosskirche (Palace Church), which is one of the famous Upper Swabian Baroque buildings.

The tour will end at the Zeppelin Museum. You will get an introduction in the Zeppelin Museum Friedrichshafen concerning „technique & art“.

Cost per person: 4,20 € plus 19% VAT

(guided tour, without entrance fee for the Museum. A visit there can be added spontaneously, tickets are available directly at the museum [7,50 € per adult, 6,50 € per adult in case of a group of 10 people]).



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Registration is necessary. Please indicate your participation at the online registration.

## SOCIAL PROGRAMME

Wednesday, 19<sup>th</sup> September 2012

18:30 – 22:30

### Conference Dinner at the MS Lindau

Meeting point: shipping pier Friedrichshafen

Enjoy a boat trip on the Lake Constance. The boat takes you from Friedrichshafen around the Lake Constance – an unforgettable experience. On board a regional buffet with regional wines will be served.

At 22:30 the boat will take you back to Friedrichshafen. As seating capacity is limited, please order early to avoid disappointments!

Cost per person: 39 € plus 19% VAT (Boat trip incl. buffet and 2 drinks)

Registration is necessary. Please indicate your participation at the online registration.



## GENERAL INFORMATION

### VENUE

#### **Graf-Zeppelin-Haus**

Olgastraße 20  
88045 Friedrichshafen/Germany  
Phone: +49 (0)7541 288-0  
www.gzh.de

### CONFERENCE OFFICE

#### **until 14 September 2012**

DECHEMA e.V.  
Andrea Köhl  
Theodor-Heuss-Allee 25  
60486 Frankfurt am Main/Germany  
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Fax: +49 (0)69 7564-441  
eMail: koehl@dechema.de  
Internet: www.euradh.org

#### **16 – 20 September 2012**

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Olgastraße 20  
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Phone: +49 (0)69 7564-235  
Mobile: +49 (0)162 4141 162  
eMail: koehl@dechema.de  
Internet: www.euradh.org

### OFFICE HOURS

The conference office is open

Sunday	16 September 2012	17:00 – 19:30
Monday	17 September 2012	08:00 – 18:00
Tuesday	18 September 2012	08:00 – 18:00
Wednesday	19 September 2012	08:30 – 14:00
Thursday	20 September 2012	08:30 – 14:00

## GENERAL INFORMATION

### REGISTRATION FEES<sup>\*)</sup>

The registration fees include admission to all sessions, exhibition and poster programme, the list of participants, a book of abstracts and a CD with extended papers, the Welcome Reception on Sunday, 16 September 2012, the Poster Discussions on Monday, 17 September 2012 and Tuesday, 18 September 2012 as well as catering during the breaks.

	Members <sup>1)</sup>	Others
Delegate	650 €	665 €
Student <sup>2)</sup>	325 €	340 €
Exhibitor	1,490 €	1,490 €
Conference Dinner <sup>3)</sup>	39 €	39 €

\*) No VAT requested according to § 4.22 UStG.

1) Personal members of DECHEMA e.V., SFA (Section Française de l'Adhésion of the Société Française du Vide), SAA (Society for Adhesion and Adhesives), the Adhesion Society in Spain and EFC/EFCE passport holders.

2) Proof of status required

3) plus 19% VAT

### CANCELLATION AND REFUNDS

30 € administrative costs will be charged for cancellations of registrations by **24 August 2012**. Thereafter 80% of the registration fee will be charged. Only written cancellations will be accepted. If the event is cancelled by DECHEMA the registration fees for the conference will be refunded. Further claims for compensation are excluded.

### LANGUAGE

The conference language will be English.



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## GENERAL INFORMATION

### FRIEDRICHSHAFEN, LAKE CONSTANCE

Friedrichshafen is located at the shores of Lake Constance (Bodensee), in the south of Germany. The panoramic situation at Lake Constance, bordering onto Germany, Austria and Switzerland makes Friedrichshafen one of the most interesting conference venues in Germany. The city is the home of the Zeppelin airship.

For more information on Friedrichshafen please look at [www.friedrichshafen.de](http://www.friedrichshafen.de)

### VISITORS' INFORMATION

Tourist-Information Friedrichshafen

Bahnhofplatz 2

88045 Friedrichshafen

Phone: +49 (0)7541 3001-0

eMail: [tourist-info@friedrichshafen.de](mailto:tourist-info@friedrichshafen.de)

### Opening Hours in September:

Monday to Friday 09:00 – 12:00

and 13:00 – 18:00

Saturday 09:00 – 12:00





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Zurich/CH

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### EXHIBITORS



**BASF SE**  
Ludwigshafen/D



**C3 Prozess- und Analysetechnik GmbH**  
Haar/D



**Krüß GmbH**  
Hamburg/D



**LUM GmbH**  
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